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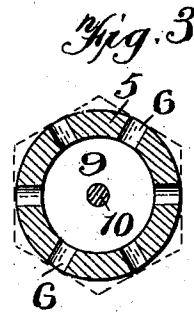
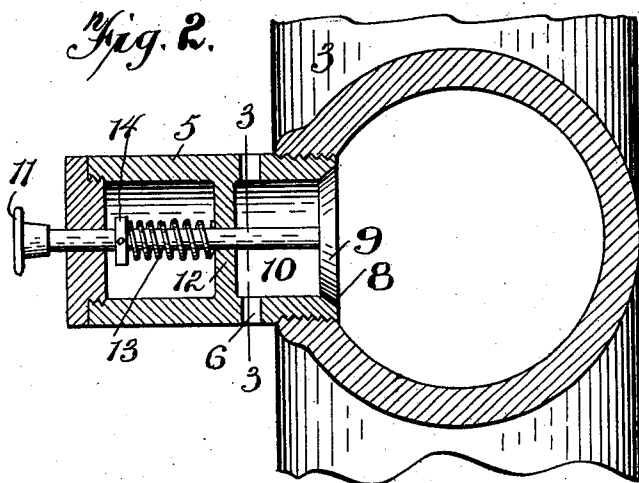
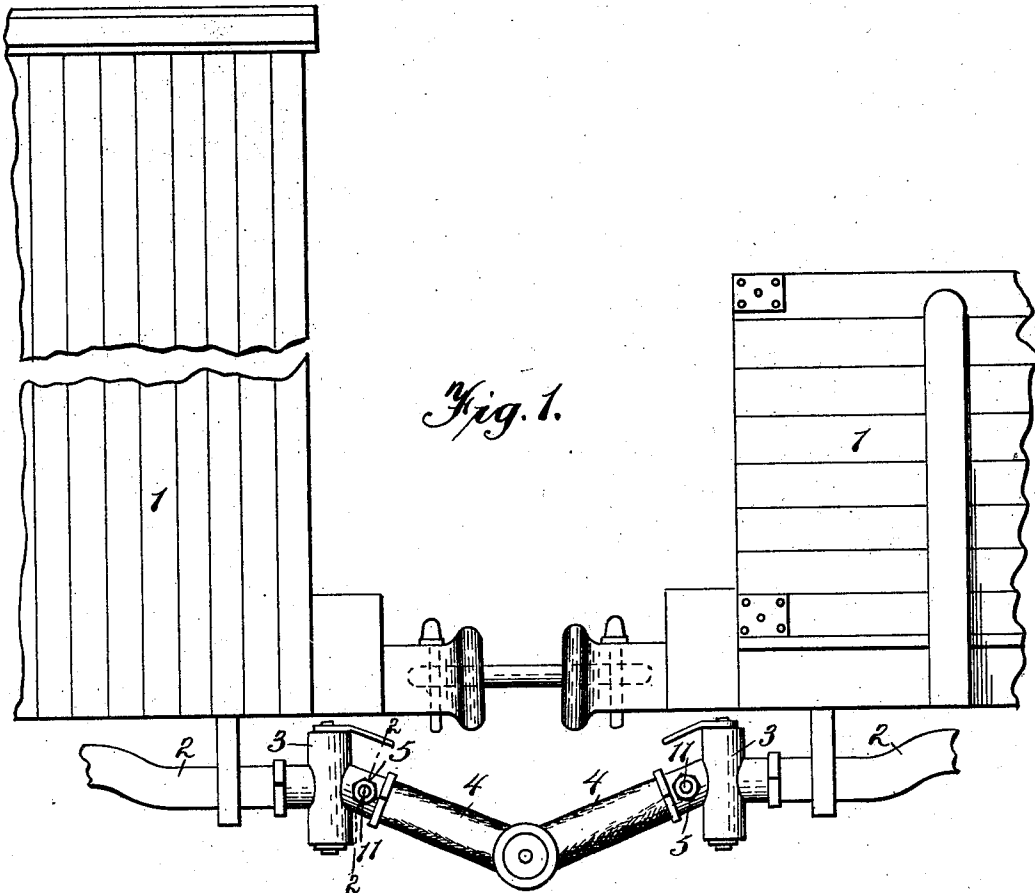
J. B. BRIGGS, JR.

AIR BRAKE.

(Application filed Mar. 22, 1902.)

(No Model.)

2 Sheets—Sheet I.



Witnesses

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384

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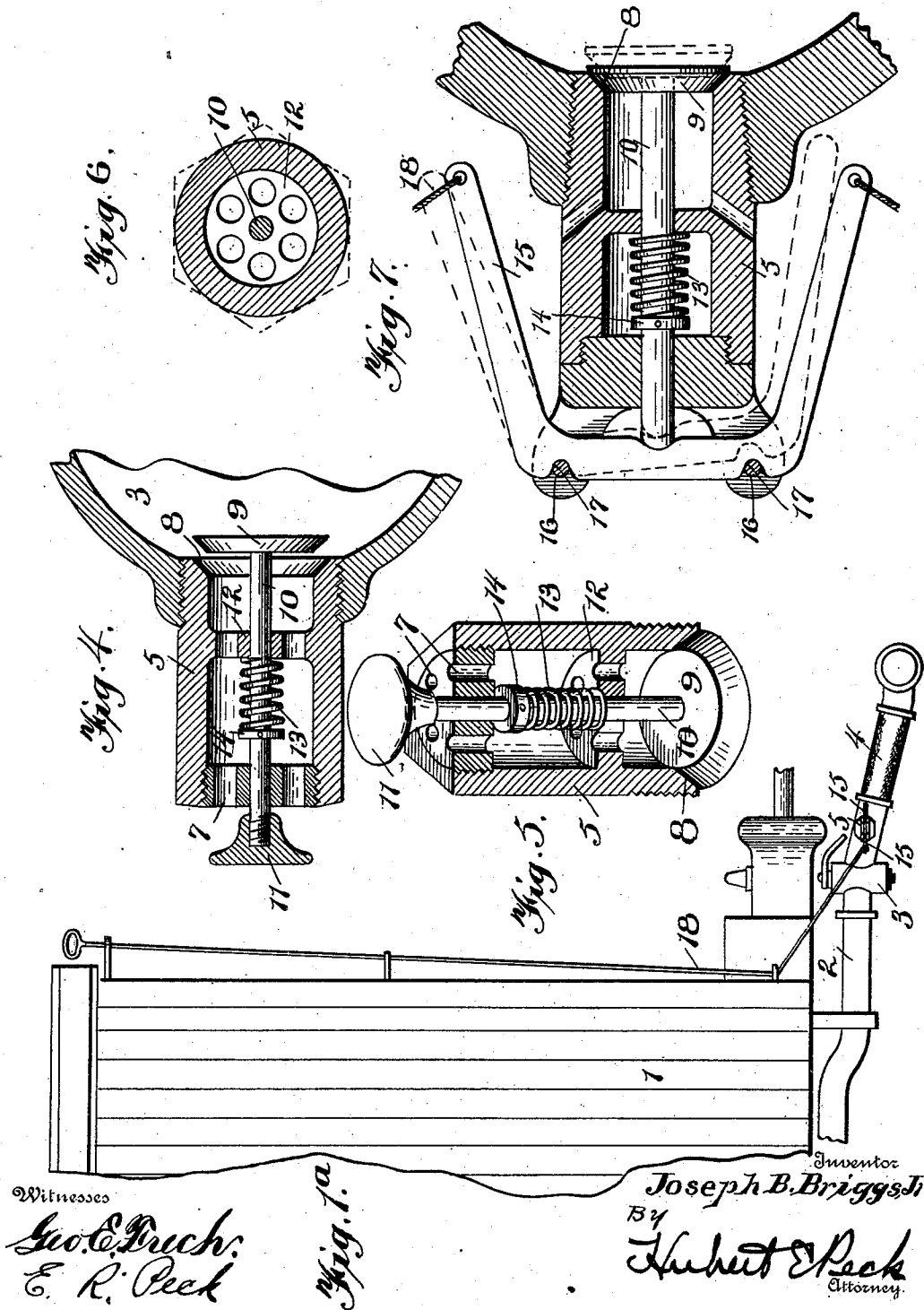
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

JOSEPH B. BRIGGS, JR., OF RUSSELLVILLE, KENTUCKY.

AIR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 712,249, dated October 28, 1902.

Application filed March 22, 1902. Serial No. 99,491. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH B. BRIGGS, JR., a citizen of the United States, residing at Russellville, Logan county, Kentucky, have invented certain new and useful Improvements in Air-Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain improvements in air-brakes, and more particularly to improvements in the connections between the air-pipes of railroad and other cars.

An object of the invention is to provide improved means for the release of air or pressure in those portions of the air-brake piping or connections located between the cars of a train whereby the operator or brakeman after closing the angle-cocks in the air-pipes at the car ends can easily and quickly relieve the excessive pressure in the flexible hose or connections between the cars before attempting to uncouple or break the connections or coupling between said hose.

A further object of the invention is to provide relief or release valves in the air-pipes or connections between cars so arranged and constructed that the operator or brakeman can easily and quickly open the valves either from the ground when the cars are at rest or from the cars when in motion.

A further object of the invention is to provide certain improvements in construction and in arrangements whereby an efficient release-valve will be produced of material advantage.

The invention consists in certain novel features in construction, in arrangements, and in details, as more fully and particularly pointed out and specified hereinafter.

Referring to the accompanying drawings, which show merely for purposes of explanation examples of several devices within the spirit and scope of my invention, Figure 1 shows the hose-pipes connecting the air-brake pipes of two adjoining cars, the hose-pipes being coupled together and the car ends being indicated, the application of my invention being shown. Fig. 1^a shows the air-brake-pipe end, the angle-cock, and hose, the car end being indicated, showing another form of re-

lease-valve applied to the angle-cock casing and provided with operating means readily accessible to a person on the car. Fig. 2 is a cross-section, enlarged, on the line 2 2, Fig. 1. Fig. 3 is a cross-section taken on the line 3 3, Fig. 2. Fig. 4 is a longitudinal section through another form of relief-valve, the valve being shown opened. Fig. 5 is a sectional perspective of the valve shown in Fig. 4, the valve being shown closed. Fig. 6 is a cross-section through the valve of Figs. 4 and 5, dotted lines indicating the exterior angular formation of the outer end portion of the valve-casing to enable a turning implement to firmly grasp the casing. Fig. 7 is an enlarged longitudinal detail section of the valve of Fig. 1^a, showing the operating device in elevation, dotted lines indicating different positions which can be assumed by the parts when the valve is opened.

In the air-brake systems now in general use it is necessary to handle the air-brake hose and bend the same in order to break the coupling when containing air under something like seventy pounds' pressure, more or less. It is very difficult to manipulate the hose when containing air under such high pressure, rendering it often necessary for the brakeman while standing between the cars to bend the hose over his knee in order to separate the coupling uniting the two hose-sections. This requires the brakeman to assume a cramped position while between the cars in exercising great force to separate the coupling between the hose-sections. Consequently should the cars suddenly move for any reason the brakeman is very apt to be caught and lose his life or suffer serious permanent injury. Many such accidents have happened for this very reason—viz., the difficulty in releasing the coupling between the hose-sections while the hose contains air under such high pressure. So far as I am aware no practical and successful means have heretofore been provided to release or reduce the air-pressure from the hose-sections while the train brake-pipes contain air under high pressure, so that the hose-sections can be easily manipulated or bent to uncouple the coupling members.

In the drawings, 1 indicates the cars (freight, passenger, or tramway) provided

with any arrangement of air-brake system wherein air is maintained under pressure and comprising the train brake-pipes 2 at the ends of the car provided with the angle-cocks 3, which are well understood by those skilled in the art. To the lower end of the metal casing of each angle-cock the flexible hose-section 4 is united by a suitable pipe coupling or connection. The free end of the hose-section carries a suitable coupling member adapted to interlock with the corresponding coupling member of the hose of the next car of the train, so as to establish a conduit or connection through the hose-sections and their detachable couplings from brake-pipe to brake-pipe.

The constructions so far described are those in general use, and it is needless to enter into a detailed description of the manner of effecting and breaking the detachable coupling between the two hose-sections.

In carrying my invention into effect I provide a release-valve for the compressed air at a point between the valve of the angle-cock and the detachable coupling member at the free end of the hose-section, so that by turning the valves of the angle-cocks to shut off communication through the same, and thereby cut off the hose-sections from the train or brake pipes, the operator (brakeman) can then move the release-valves for each hose-section and allow the compressed air to escape until the pressure is relieved in the hose-sections. The operator can then easily bend or manipulate the hose-sections to the necessary extent to separate the detachable coupling members. In the examples illustrated a hole is tapped through the end portion of the angle-cock casing projected beyond the turn plug or valve therein, so as to open into the air-passage therethrough. Into this hole is screwed the exteriorly-threaded inner end of the release-valve casing 5, so that the inner end of said casing 5 when open will open into the air-passage of said angle-cock casing. The casing 5 is usually in the form of a short metal box or partially-cylindrical hollow casing exteriorly threaded at its inner end to screw into the hole in the angle-cock casing, and thereby rigidly secure the release-valve casing to and projecting laterally from said angle-cock. The inner end of casing 5 is open, (except for the valve herein-after described,) and the interior of said casing 5 forms an air chamber or passage, having suitable air-outlets through any desirable part thereof at the exterior of the angle-cock casing. For instance, the casing 5 can have the series of radial outlet or exhaust openings 6 through the peripheral portion thereof, (see Figs. 2 and 3,) or the air can exhaust throughout the length of casing 5 and out through the exhaust openings or perforations 7 in the outer end head thereof, as shown in Figs. 4 and 5. The outer exterior portion of the casing 5 is usually formed angular or with flat faces, so that a wrench or other tool can grasp

and rotate the same in screwing the casing into the angle-cock casing.

The inner end edge of the casing 5 is shown beveled inwardly to form the annular valve-seat 8 to receive the correspondingly beveled or inclined surrounding or circumferential edge of the flat circular imperforate (preferably metal) disk forming the reciprocating valve 9. This valve 9 normally fits and tightly closes the inner end of casing 5 and effectually cuts off the interior thereof from the air-passage of the angle-cock, and the air-pressure against the outer flat face of said valve 9 tends to maintain the same tightly. When the said valve is moved inwardly from the end of the casing 5 into the hole in or air-passage of the angle-cock casing, the exhaust through the casing 5 from the angle-cock air-passage is open.

Suitable means are provided whereby the operator can easily and quickly operate the valve 9 to release the air from the hose through casing 5. It is desirable that means be provided to maintain the said valve 9 normally closed and to automatically close the same the instant it is released to avoid the possibility of trainmen leaving the valve open through carelessness after exhausting the compressed air. As a simple and effective operating device I provide a rigid stem 10, rigid with the valve 9 and extending from the center thereof longitudinally through the casing 5 and the necessary distance beyond the outer end of said casing. The outer end of said stem can be provided with a rigid button or finger-piece 11, to the outer face of which the finger can be applied to press in the valve 9. (See Figs. 1, 2, 4, and 5.)

12 is a cross web or spider rigid within the casing 5, forming a guide for the reciprocating stem and through which the same slides. In the form shown in Fig. 4 the bridge or partition is in the form of a perforated head, as the air must exhaust therethrough to the end of the casing 5.

13 is a coiled expansive spring located on the valve-stem and compressed between the guide 12 and a pin or stop 14, carried by the stem, and hence yieldingly maintaining the valve 9 closed and automatically returning the valve to the closed position after being pressed open and released.

The inner end or shank of the finger-piece or button 11 can abut against the outer end of casing 5 and form a stop limiting the inward or opening movement of the valve 9.

In Figs. 1^a and 7 I show a different means for reciprocating the valve and opening the valve against the pressure of its closing-spring. For instance, a double-acting lever or handle 15 can be provided to engage and force the valve-stem inwardly. In this connection the casing 5 is shown provided with rigid ears or lugs extending outwardly from and rigid with its outer end. These ears carry the two rigid fulcrums or bearings 16, located a distance apart and on opposite sides

of the axial line of the valve-stem, the said fulcrums being arranged transversely of the casing 5 and a distance outwardly beyond the outer end of the casing. The lever 15 is arranged between said fulcrums and the casing end, and the end of the valve-stem abuts against the inner edge of the lever at a point midway between the two fulcrums and by means of its spring yieldingly holds the lever outwardly against said fulcrums. The lever can be notched at 17 17 to form bearings receiving and turning on said fulcrums. The opposite ends of the lever beyond the fulcrums are shown deflected inwardly at an angle to form handles or lever ends. The lever can be swung from either end to press in the valve-stem and open the valve 9, and either bar or fulcrum can serve as the fulcrum for the lever. The lever when swinging moves inwardly from one fulcrum and rocks on the other, the lever rocking alternately on the fulcrums, according to the end to which the operating force is applied. The lever can be swung by hand to open the valve and hold the same open the desired length of time, or pull connections 18 18 can extend from one or both ends of each lever to a point on the car, so that an operator on the car can by pulling a connection 18 swing the lever and open the release-valve under circumstances where an emergency application of the train-brakes is necessary when the train is moving. It will hence be noted that this release-valve can be employed as a conductor's valve, said valves being located between all the cars on the train and readily accessible, so that the trainmen can easily exhaust air from the train brake-pipes for applying brakes in case of emergency or for attracting the engineer's attention.

It might be possible for the trainmen to reach down from the cars and press the button 11 to release air while the train is in motion, and also various operating connections might be employed extending into the car other than those here shown. Also I do not wish to limit all features of my invention to locating the release-valve in the angle-cock casing nor in any particular part of said casing, as it might be located at some other point between the angle-cock valve and the valve in the coupling member at the free end of the hose or in other loose or flexible connections which might be employed between the cars. Also I do not wish to limit myself to a strict construction of the term "angle-cock" herein employed, as I employ this term for convenience and in a broad sense to mean any metal or rigid part of the train brake-pipe connection at the end of the car outside of the valve or cock, usually located in the angle-cock casing.

By providing a release-valve for exhausting air from the hose I not only gain the advantages hereinbefore set up, but by releasing the pressure from the hose before the same is bent and manipulated to break the coupling

wear on the gaskets in the hose connections and wear on the hose will be reduced to a minimum, and the extent of wear at these points under present methods will be most effectually reduced.

The release-valve is very durable, as there are no parts to wear or require renewing, except metal parts capable of long use without wear.

It is evident that various changes might be made in the forms, constructions, and arrangements of the parts described without departing from the spirit and scope of my invention. Hence I do not wish to limit myself to the exact constructions shown, but consider myself entitled to all such changes as fall within the spirit and scope of my invention.

What I claim is—

1. An air-brake system having an air-release valve arranged between the angle-cock valve and the coupling at the free end of the hose-section, to release the air-pressure from the hose and comprising a separate casing secured in the angle-cock casing, substantially as described.

2. An air-brake system having an air-release valve in the air connection of the angle-cock casing between the hose-pipe section carrying the coupling member and valve of the angle-cock, a spring yieldingly holding said valve closed, and manually-operated means for opening said valve against the pressure of said spring to allow escape of compressed air from said connection, substantially as described.

3. An air-brake system comprising angle-cocks at both ends of each car, and hose-sections from the angle-cocks and at their free ends carrying detachable coupling members, and release-valves located in said angle-cocks, each release-valve comprising a casing secured in and opening into the air-passage of the angle-cock with an exhaust into the outer air, and a spring-held valve normally shutting off escape through said casing and provided with manually-operated opening means, substantially as described.

4. An air-brake system having a separate spring-held air-release valve provided with exposed manually-operated opening means and comprising a hollow casing, each coupling hose-pipe connection having one of said valves for exhausting the air-pressure therefrom, said casing opening into and extending laterally from a part rigid with the angle-cock casing, as described.

5. An air-brake system having train brake-pipes for the compressed air, and hose connections therefor with detachable coupling members between each car, and spring-held air-release valves from each hose connection and each provided with manually-operated opening means accessible from the cars each release-valve comprising a hollow casing screwed into and projecting laterally from said connection, substantially as described.

6. In an air-brake system, a rigid connec-

tion having a passage for the compressed air, and a lateral hole through the connection to said passage, an air-release valve comprising a hollow casing screwed into said opening, 5 said casing projecting laterally from said connection and having exhaust-passages from its interior and having its inner end edge forming a valve-seat, a reciprocating valve closing against said seat to shut off the casing 10 from the air-passage and to move inwardly from said seat to permit the compressed air to exhaust from said passage through the casing, a stem from said valve through the casing and extending to the exterior thereof and provided with manually- 15 operated opening means, and a spring in the casing yieldingly holding the valve closed, substantially as described.

7. An air-brake train connection having a 20 lateral opening, a release-valve hollow casing secured therein and projecting laterally therefrom and having an exhaust-opening, and a spring-held valve yieldingly closing said casing from the air-passage of the train connection 25 and provided with a valve-stem and a

double fulcrum two-armed lever bearing against said stem and arranged to reciprocate the stem to open the valve against the pressure of its spring, substantially as described.

8. An air-release valve for a compressed- 30 air-brake system comprising a hollow casing exteriorly threaded at its inner end and having its inner edge internally beveled to form a valve-seat, a disk valve closing against the inner end of said casing to close the same 35 and provided with a sliding stem extending longitudinally through the casing and beyond the outer end thereof, guides for said stem and rigid with the casing, said casing provided with an exhaust-opening, a spring in the 40 casing yieldingly holding said valve closed, the exposed outer end of said stem provided with means, whereby the stem can be forced in to open the valve, substantially as described.

In testimony whereof I affix my signature 45 in presence of two witnesses.

J. B. BRIGGS, JR.

Witnesses:

G. B. HUTCHINGS,
W. E. RAY.